North Carolina Department of Transportation
Transportation Program Management Unit - Value Management
Innovative Technologies and Products Awareness Report
March 6, 2019

PRODUCT HIGHLIGHT – Wrong Way Driver Detection System

In 2018, the North Carolina Turnpike Authority implemented a wrong-way vehicle detection pilot program on the Triangle Expressway, the toll section of I-540, to effectively alert wrong-way drivers and more quickly notify first responders of wrong-way vehicle incidents on the facility. It was found that an average of two to three drivers per month were driving the wrong direction. To improve safety, the Turnpike Authority installed five different detection systems at four locations along the interstate for evaluation. Four systems are located on off-ramps with designs more prone to wrong-way driver incidents, and one is on the mainline of the expressway.

Illuminated Wrong Way sign

Three-section inductive loop system

Each system uses one of three methods to detect wrong-way drivers. The on-ramp sites use radar detection; two of which will record the instance while illuminating Wrong Way signs to alert the driver. One of the on-ramps also uses a thermal camera to provide real-time video for detection as most wrong-way driver incidents occur at night. The mainline site uses inductive wire loops embedded in the pavement in three separate sections along the main roadway to detect wrong-way drivers. This system also illuminates Wrong Way signs. Each system has its own type of alert sequence using emails, texts, audio or video recording along with data collection. Notifications from each system are sent to the Traffic Management Center who can quickly notify State Highway Patrol of a wrong way driver. As of January 2019, four wrong-way vehicles have successfully turned around and not entered the mainline of the Triangle Expressway. The Turnpike Authority plans to implement similar technology on the Monroe Expressway. Similar systems have been used in Florida, Arizona and Texas.

PRODUCT INNOVATION – Drones for Disaster Response

In 2017, the N.C. Division of Aviation began establishing policies and procedures to use Unmanned Aircraft Systems (UAS), also known as drones, for disaster response, project inspection, traffic monitoring, and construction monitoring. Aviation developed their Federal Aviation Administration approved UAS Integration Pilot Program to educate people who wish to use drones on the rules and regulations. Pilot permits are needed for commercial and government use. There are currently 31 drones in the state's fleet for various uses. Aviation is also developing working groups from business units across the Department who are interested in drone integration that can help establish the technology.


Drone footage of dam breach at Boiling Springs Lake, NC

Drone disaster response benefits were demonstrated in 2018 in the wake of Hurricane Florence. The flooding from the storm caused massive damage to the state's infrastructure and required accelerated assessments of the impacted roads, bridges, airports, ferry terminals, waterways and dams. The N.C. Division of Aviation volunteered to lead a coalition of fifteen drone teams to support seven government agencies including the N.C. Department of Public Safety, U.S. Coast Guard and Federal Emergency Management Agency with their disaster relief efforts. Over 260 missions were flown with more than 8,000 videos and images captured to account for the constantly changing landscape and conditions. The agencies were able to use drone footage to determine accessible routes for evacuations, emergency responders, direct the traveling public, and plan infrastructure repairs. Secretary Trogdon was presented with two awards from the National Operations Center of Excellence for his leadership and the Department's response to Hurricane Florence.

For more information, please visit: https://www.ncdot.gov/divisions/aviation/uas/Pages/default.aspx